

DEPARTMENT OF COMMERCE
WASTE-RECLAMATION SERVICE
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REPORT OF AN INVESTIGATION

OF

THE AKRON INDUSTRIAL
SALVAGE CO.

A COMMUNITY INCORPORATED WASTE-SAVING EXPERIMENT



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REPORT OF AN INVESTIGATION OF THE AKRON INDUSTRIAL SALVAGE CO.

THEORY AND PROGRAM.

The Akron (Ohio) Industrial Salvage Co. is in reality a civic movement for the development of a city-wide system of waste reclamation to deal not only with the waste of the home, but also with the waste of the store and factory. Fostered by the industrial leaders of the community, the firms and corporations holding the stock of the salvage company represent approximately 75 per cent of the industrial capitalization of that community.

The theory underlying the experiment is that every article has a value in use and that every avenue of waste utilization should be so investigated that no article which can be used in industry shall be destroyed. Nor will the company limit itself to this field of investigation; new methods of utilization will be studied and industries established within the community to consume the by-products of industrial and communal life. This community commercial enterprise, operated with an ideal, will be so developed that the profits which may accrue will not all be distributed in the form of a dividend, but will be expended to defray the cost of the research work which will be necessary in order to further this theory of waste reclamation.

It is the belief that habits of thrift can be inculcated by demonstrating to the members of the company, as well as to the community at large, the added value which accrues through the proper sorting of material, as well as the added price which can be secured through the handling of large quantities. It is believed that this will have a tendency to check the present system of destruction of material when the accumulation in the hands of the individual is small.

It is the idea that the pooling system will enable the individual or firm with a small daily or weekly accumulation to dispose of it at the same price per pound as is now secured only by firms with a larger turnover, and at the same time handle it at the same cost per pound for each, irrespective of volume. This will have a tendency to encourage saving on the part of the individual or firm who previously destroyed because it was too expensive to attempt to accumulate sufficient material to make a fair return.

A WAR-TIME CONCEPT—A PEACE-TIME DEVELOPMENT.

The Akron Industrial Salvage Co. is a direct outgrowth of the activities of the War Industries Board. The plan was originated by the Commercial Economy Board of the Council of National Defense (later transferred to the War Industries Board). It was further developed by the War Prison Labor and National Waste-Reclamation Section (later transferred to the Department of Commerce as the Waste-Reclamation Service); but its successful operation is attributable to the activity and interest of George W. Sherman, manager of the salvage department of the B. F. Goodrich Co., of Akron, Ohio. The theory was evolved in war times; its feasibility was demonstrated after the signing of the armistice.

The plan was laid before Mr. Sherman by representatives of the War Industries Board early in January, 1918, with an idea of having an investigation made as to the feasibility of an incorporated waste-saving movement. After a preliminary investigation in Akron, Ohio, Mr. Sherman placed the matter before the chamber of commerce, and a salvage committee was appointed to further study the question. In accordance with the recommendation of the committee, a number of interested persons organized the Akron Industrial Salvage Co., which was incorporated May 10, 1918, under the laws of the State of Ohio. The company was capitalized for \$25,000, each share being \$100 par value.

EARLY PROGRAM.

At the time of incorporation the directors had not established a definite program for operation, and for several months they experimented with different methods to determine which would be the most advisable to adopt as the basis of operation. The company attempted to serve as a selling agent solely for the material, which was to be moved by the company direct from the store or factory to the consumer. This plan proved unworkable, due to the small amount of accumulation and the multiplicity of grades which were secured.

At that time the directors were interesting only firms of small capitalization, it being the idea that these industries had relatively the largest amount of waste. It was further believed that the small industries would be suspicious of any movement that was supported by the heavily capitalized concerns.

The converse was the truth; the smaller firms were skeptical of the success of a movement that apparently had not received the support of the larger concerns. It then became necessary for the company, in order to secure the additional tonnage, to interest the firms which had a large volume of waste. After a brief campaign sufficient stock was sold to the larger concerns to warrant proceeding along the orig-

inal line, and the company again endeavored to act as a sales agent. But the situation in regard to the multiplicity of grades was simply intensified, and it was necessary to discover a new basis of operation.

It was then proposed that the company utilize the facilities of an established waste merchant—the company to turn over the material to him for sorting, but to be responsible for the collection, sale, and payment of the individual accounts. However, the cost of the sorting service was prohibitive, and the refusal of the dealer to receive material that might be considered inflammable rendered it imperative that the company develop an entirely different method of procedure if they were to carry out the concept upon which their company had been founded and organized, namely, that they should find an avenue of use for every item of waste.

The company then determined to take charge not only of the collection and sales but of the sorting as well, and in order to carry out this project it was necessary to secure a warehouse. After extensive negotiations, due to the fact that warehousing was at a premium at that time, they secured a warehouse with railroad-siding facilities.

PRIMITIVE EQUIPMENT.

The warehouse, which contains approximately 45,000 square feet of operating space, is ill adapted to the needs of the company. The sagging floors and windows without glass would have been sufficient to daunt a less courageous group. But the directors were certain that despite all handicaps the project could be successfully developed, and in spite of these obstacles the first consignment was moved into the warehouse on September 21, 1918. Before the material could be handled it was necessary to shore up the floors, build sorting tables out of scrap packing boxes, and to install a crude heating system. The company was forced to expend over \$2,000 of their meager capital for repairs before a pound of material could be handled.

An idea of the way difficulties were met and overcome by this pioneer movement in community waste saving can be gained from the fact that the approach to the building is of such a nature that all material must be unloaded outside the building and carried by hand into a poorly lighted basement prior to being sent to the sorting room, which is situated in the upper story of the warehouse. This material is moved to the sorting room by an elevator operated without power. The hand winch required the combined strength of two men in order to raise and lower the elevator. Such a system, however, required the expenditure of too much energy, and another system had to be devised. By passing a rope over a series of pulleys and hitching the rope to a whiffletree, a horse is now utilized for this purpose; and amid a Babel of shouted orders the

material is slowly hoisted to the sorting room by means of this "one-horsepower" system.

The sorting equipment is as primitive and crude as the elevator. Many commercial firms handle waste paper over a moving canvas belt or conveyor and bale it with a power baler. The company, until they could demonstrate the feasibility of the project, were not justified in making a large expenditure for equipment. The methods they devised to meet the situation but add color to the plant. Bags made of scrap burlap, and which hang from the ceiling of the first floor, receive the sorted material from the sorting tables on the second floor. These bags, which are about 20 feet in length, hang like huge brown icicles along one side of the baling room, and with their grotesque stalactitic formation make the plant a veritable "Old Curiosity Shop." The bags, which are tied at the bottom, are emptied into a hand baler that is moved from bag to bag, so that one baler is sufficient to handle the entire output.

In addition to the warehouse, there is additional storage space in a shed which has approximately 3,900 square feet of floor space. This, in addition to the half acre of ground, gives adequate storage facilities for material that does not have to be protected from the weather, and the yard and shed are filled with boxes, barrels, and nondescript items of waste.

FINANCIAL RETURN.

The Akron Industrial Salvage Co., operating in an inadequate building and with this crude and makeshift equipment, has demonstrated beyond question that the plan is both practicable and profitable. From October 1, 1918, to January 1, 1919, they handled about 600,000 pounds of waste material and sold approximately 220,000 pounds. The sale value of the material was slightly more than \$6,000. The cost of operation, including all expenditures incidental to incorporation, repairs to building, and purchase of equipment, was a little more than \$11,600. The inventory value of the material on hand, January market quotation serving as the basis of valuation, was about \$10,000.

A study of the financial statement for the months of January and February, 1919, indicates that the company is rapidly developing its organization and standardizing its method of operation. During the first two months of 1919 the company handled approximately 1,000,000 pounds of waste material, which was an increase of 74 per cent over the amount handled during the previous three months. The value of the material sold was a little more than \$12,000, or an increase in the gross return of 96 per cent; the cost of operation was but \$11,000, or a decrease of 4 per cent over the cost of the

previous three months. This showing was made on a declining market. The apex of the price curve for waste material was reached in October of 1918; from that time there was a downward movement more or less sharp until January, 1919, when prices were nearing the prewar level. Despite this decline the company found an active market and secured attractive prices for its material. This statement reveals the potentiality that lies in this movement for the organization of a salvage company operated for the benefit of the community.

This increase in tonnage for the months of January and February can be accounted for by the fact that contracts for the disposal of waste material usually terminate at the first of the year. The member firms, in renewing their contracts, withheld certain items and arranged to turn designated materials over to the salvage company. Another explanation lies in the fact that certain firms, handling their own waste, were finding it more profitable to turn over certain grades of unsorted waste to the company and have the same sorted and sold through that channel. The experience of a manufacturing concern of international repute in handling its waste is a case in point. This concern, operating with a rather skilled personnel, which was entitled to all the benefits of the company's plans for welfare, vocational education, and insurance, and utilizing floor space which had a high theoretical rental charge per square foot, could only handle its waste paper and similar lines of waste at a relatively high cost per pound. The Akron Industrial Salvage Co., employing a less-skilled group and operating in a building where the cost per square foot was low, was enabled to handle such material at a low tonnage cost. These facts were called to the attention of the concern in question, and upon investigation the directors decided to turn over all waste paper from their plant to the salvage company, thereby assuring the company of a large and steady volume of waste material that could be handled at a low cost per pound. A further increase in tonnage of this nature may be expected, as the question of turning over the rag waste from this same industry is now under advisement, and in case the company can successfully handle these two items of waste at a low cost per pound it is believed that a number of other firms will adopt this policy and will turn over the bulk of their waste paper and similar items of waste to the salvage company, thereby decreasing the activities of the salvage department of the individual firms and corporations and eliminating in a large measure the duplication that now exists as a result of the independent sorting systems maintained by the larger firms.

Despite this increase in tonnage, the company has not at any time secured all the waste of any one firm or corporation holding stock in the salvage company. On January 1, 1919, there were 115 firms

holding stock in the company. The amount of material turned in by them was as follows:

Firms turning in material.	Quantity.	Firms turning in material.	Quantity.
	<i>Pounds.</i>		<i>Pounds.</i>
41 turned in	0	4 turned in less than	7,500
4 turned in less than	250	2 turned in less than	10,000
3 turned in less than	500	4 turned in less than	15,000
20 turned in less than	2,000	3 turned in less than	20,000
13 turned in less than	4,000	4 turned in less than	30,000
8 turned in less than	5,000	9 turned in more than	30,000

The statement for January reveals with what success the company was enabled to apply the theory that all material should be consumed as far as practicable in the home markets. Eight per cent of the cost of operation for this month was charged against drayage of the material from the business places to the sorting plant and from that point to the consumer; but 0.09 per cent of the cost of operation is charged against freight. The company was enabled to find an attractive market within the limits of the city, thereby eliminating the system of cross-shipments which characterizes the waste trade.

METHOD OF MEASURING COST.

In determining how the seller should be reimbursed for his material the company has evolved a rather unique system of costs and payments. The system is modeled upon the plan in vogue in some plants where the departments are charged for their bulk weight and credited with the net proceeds. Upon delivery of the material to the driver of the salvage company the seller is furnished with a memorandum shipping sheet upon which the driver certifies that material approximating so many pounds was received. A second sheet is accomplished when the material in bulk is received and weighed in at the warehouse, the firm being credited with the weight unsorted. The material is then sent through the sorting room to be graded, and the bulk is broken into its component parts and the third record entered upon the books of the company, crediting the concern with the different grades and weight of each grade. In filling an order for a particular grade the item which may be credited to the account of several firms will be sold and each firm credited with its share in proportion to the amount of material sold in the pool. After the cost of operation is deducted each firm will be paid for its portion of material sold.

The cost of operation is determined on a pound basis and in working out this system the plan in vogue in some industries operating salvage departments has been followed. The total monthly cost, including depreciation and interest charges, actual or theoretical,

is divided by the volume handled, which gives the theoretical cost per pound. This system, with modifications to suit their peculiar needs, has been followed by the salvage company in determining its charges.

This system has both advantages and disadvantages. Unless the tonnage is large and uniform the cost of handling is certain to be excessive and the amount of sales limited, due to the fact that it may be several months before sufficient quantity of any one grade can be secured. In addition, there is the disadvantage of deferred payment; a firm may not receive payment in full on all of a shipment of a given date for two or three weeks in the case of waste paper, and possibly several months in the case of scrap iron. Apparently the advantages outweigh the disadvantages, because the members are satisfied with the system and this may be attributed to the fact that the return for a pound of material handled through this system is usually higher than when it is sold unsorted. But it is doubtful if any commercial enterprise could follow such a system and hold its clientele. It is due to the fact that the Akron Industrial Salvage Co. is primarily a community saving plan which permits the successful adoption of such a system.

These are the salient features of the Akron, Ohio, community waste-saving program, which is only in its infancy; but, judging from the past development, as well as from the plans now under consideration, it is safe to predict that this movement, which is the outgrowth of the war-time efforts for conservation, will make a fundamental contribution to the movement for waste conservation.

FUTURE DEVELOPMENT—WASTE DRIVES FOR CITY CHARITIES.

The Waste-Reclamation Council of Akron, Ohio, a body appointed by the mayor at the request of the Department of Commerce to deal with waste reclamation in that center, is now considering a plan for the organization of a waste-material drive, the proceeds of the sale of the material to be applied to the charitable work of that center. Under this program it is proposed that the material will be collected, sorted, and sold by the Akron Industrial Salvage Co., the net proceeds to be turned over to the organizations participating in the drive. This program is based upon a plan that has been utilized by a commercial concern in organizing similar community drives for waste material.

Under this plan the city will be districted and the waste material will be collected from the homes in a given district on a specified day. The housewife will be requested to place the waste material on the doorstep in a proper receptacle, and in case the proceeds are to be turned over to a specific organization this fact should be indicated by attaching to the bundle or bale a special tag, which is to be fur-

nished by the company. These tags will be of different colors in accordance with a prearranged schedule—red tags representing the Red Cross, blue tags for Young Men's Christian Association, etc.

The material of any designated district will be moved to the plant of the company and the material segregated, the tagged material being moved to the organization bins, and the untagged to the general pool. This material will be sorted and each organization credited with the specific grades secured in a manner similar to the credit system used by the company in handling a member's waste material. The same system of cost will be employed, and the net proceeds paid to the organization as rapidly as the material is sold. The untagged material will be handled as a general fund, and the net proceeds divided on an equal basis among all the charities participating in the drive.

By adopting this scheme the Waste Reclamation Council believes that a permanent and regular system of house-to-house collection can be established by the Akron Industrial Salvage Co., thereby assuring the housewife that her waste material will be moved at regular intervals, which will assure its saving rather than its destruction in the home. It is further believed that by arranging for the contribution of this material to the charitable work of the community the housewife will be more interested in the matter and will make special efforts to conserve the valuable waste of the home. By instituting a regular and systematic method of collection and sale of waste material the amount of expected revenue for charitable purposes can be more or less definitely determined, thereby assisting the board of managers of the organization in the formulation of the budget.

This plan will be of benefit to the salvage company, as it will assure a steady movement of material that can be handled at a relatively low cost per pound, thereby enabling the company to make a small profit to be set aside for replacement or additional research work. The salvage company will not be in a position to develop its work in accordance with the original program unless a large tonnage of quickly moving material can be secured, and it is believed that the solution of the problem lies in part in a city-wide system of collection of waste material.

Such a system will be of benefit to the consumers of waste material, as it will assure a more or less steady flow of waste material irrespective of the market. Prior to the war price was the sole stimulus for waste conservation. As demand increased prices rose, and the collector was enabled to offer an attractive price to the householder for the waste; as prices declined the collector either decreased prices or accepted only material for which there was an active demand. As a result of this situation the tendency to destroy the non-active material became fixed, with a result that sufficient material to

meet the demand did not move to the market, and prices again rose; but the level of high prices remained for some little time before the collector could overcome the habit of destruction. Such a system made it difficult for the sorter, as well as the consumer of waste material, to develop methods of determining costs when negotiating contracts for the supply of raw or finished material. The salvage company, freed from the necessity of paying the housewife for the material, will be enabled to handle it as long as the price received for the sorted material is equal to the cost of operation.

COLLECTION OF THE WASTE OF PUBLIC BUILDINGS.

In order to assist the Akron Industrial Salvage Co. to secure tonnage, the Waste Reclamation Council has evolved a system of collection of waste paper from the public schools of that city, the material to be collected, sorted, and sold by the company. Each school will be credited with the amount of graded material turned in, and the net proceeds will be turned over to the individual school for maintenance of playgrounds or activities of the student body. C. M. Woodruff, chairman of the maintenance committee of the school board and representative of the Young Men's Christian Association on the Akron Waste-Reclamation Council, has arranged to have the material moved in bags from the school to the sorting plant, thereby assuring that the material can be handled cheaply and efficiently.

The Waste Reclamation Council is also studying the question of the disposal of waste paper from the city hall and other public buildings, as well as the newspapers secured from the street cans. As soon as a workable program is developed the matter will be presented to Hon. J. S. Myers, mayor of Akron, who is keenly interested in the development of the work of the company, and it is believed arrangements can be effected so that some of this material can be handled by the company, the city to be dealt with as if it were a shareholder of the company and the material handled under the deferred-payment plan.

UTILIZATION OF PRISON LABOR.

The Chicago Salvage System may be adopted in part in the development of a campaign to organize Akron for waste conservation. The Chicago Salvage System was inaugurated at the Chicago House of Correction by the then superintendent, John L. Whitman, in the fall of 1915, the prisoners in the institution being employed in handling the waste from the public buildings, sorting it for the market, or repairing it for further use. The first financial statement of the system covers the period from November 1, 1915, to December 31, 1916. The city departments received \$129,423 for ma-

terial they had previously sold for approximately \$13,000. The city was credited with \$11,000 for the labor of the prisoners on this material, and over \$40,000 was turned into a prisoners' relief fund to be utilized for relief of the dependent families of the inmates. In addition to this return on the waste of the city departments, hundreds of articles were repaired and utilized in connection with the industries of the institution. Discarded shovels were repaired and used at the brickyard; worn harness was strengthened and put back into use; discarded parts of vehicles were utilized in making carts for use at the stone quarry; a testing plant for discarded light bulbs, received in the city waste, was established, and sufficient usable lights were found to supply the entire institution; the "dead" lights were broken up and over \$9,000 worth of platinum recovered; the broken furniture and equipment from the public schools were repaired so cheaply at the prison that the department of education suspended the operation of its repair shop and utilized the facilities of the prison for this purpose.

The Akron Waste Reclamation Council, in order to develop the program that material usable in its present form should not be destroyed in the manufacture of other commodities is investigating the feasibility of employing misdemeanor prisoners to repair the equipment of the various city bureaus and departments. In order to assure efficiency and to assist the prisoner in rehabilitating himself in the community, the council is working on the theory that the prisoner should receive a return for his labor, so that he will be enabled to contribute to the maintenance of his family. Therefore, in developing this program the spirit of the Executive order of September 14, 1918, will serve as a basis of the program for the utilization of the dormant man power in the local institution. The Executive order, which is serving as a basis of the program, directed that where prisoners were employed in the manufacture of supplies for the United States Government the "Compensation and hours of labor for inmates of any institution shall be based upon the standard hours and wages prevailing in the vicinity in which the institution is located. The pro rata cost of maintaining the inmates shall be deducted from their compensation."

TRAINING OF SALVAGE MANAGERS.

The difficulty that the Akron Industrial Salvage Co. experienced in securing the proper type of man to handle the managerial function of the salvage movement served as the basis for the program of education which is now being developed by the Waste-Reclamation Council. When the salvage company was organized on the theory that it was not a movement for profit but for betterment, the organ-

izers believed that they could not utilize the services of a man trained in the waste business, because they were operating on the theory that material should be handled because it had a value in use oftentimes far greater than its value in price. Such a system could not be followed by a commercial waste industry because it would be impossible for the concern to handle material that could not pay its way. To employ a man trained in the commercial philosophy was but to develop points of friction between the directors and the manager. The company determined to secure a man with broad business experience accustomed to presenting business propositions, so that they could be readily understood and appreciated, but, above all, one who had the confidence and respect of the business men of the community. The services of a man who had had experience in industrial promotion and advising was secured, and he, his office, and staff were taken over by the company as the administrative center of the salvage movement. Prior to September, 1918, the manager had no experience in the waste trade; but, with the advice and suggestions of Mr. Sherman, he has been enabled to take charge of the sorting and sale of the material, and through his efforts the company has been enabled to make a fair financial showing.

In order to assist other communities in organizing similar companies, a program for the development of a short, intensive training course, to be conducted by one of the local colleges, is under discussion by the Waste-Reclamation Council of Akron, because they believe that by establishing a training course for executives in conjunction with the work of the salvage company other communities can inaugurate their plans without being forced to make the same errors which characterized the operation of the salvage company during the early months of its existence. It is believed that men who have served as secretaries of chambers of commerce, business organizations, and similar bodies could be given a brief course of not more than six weeks in length at one of the colleges giving instruction in chemical engineering, the course to be more a survey of the field of by-product utilization and the use to which various items of waste can be put, rather than an intensive course in chemistry. In connection with this survey course the men could be taught sorting and grading by the extension method, each man to be assigned to the salvage departments of the large concerns for a brief period in order to gain this knowledge. It is hoped that the system can be so developed as to permit the assignment of the men to the Akron Industrial Salvage Co. for a brief period, so that the system of accounting and measurement of cost used by that company may be demonstrated and utilized in other centers.

The feasibility of adopting this program as a basis for a full-year course for men in the senior class of the institution is under consid-

eration. By giving a more thorough training in chemistry and by-product utilization, as well as industrial training through the extension method, men could be equipped to enter the field as salvage engineers, or to serve as managers of local salvage companies. As soon as these plans are more fully developed the Waste-Reclamation Council will place the matter before the trustees of one of the institutions for consideration.

The Waste-Reclamation Council of Akron, working on suggestions placed before them by the Department of Commerce, will doubtless develop a movement which will assist other communities in the development of similar movements and will make a contribution to the movement for national waste reclamation as fundamental as that which has been made in Great Britain by the National Waste Products (Ltd.), operating under the National Salvage Council.

NATIONAL WASTE PRODUCTS (LTD.)—A BRITISH NATIONAL INCORPORATED WASTE-SAVING PROGRAM.

While the Akron Industrial Salvage Co. is primarily a community waste-saving experiment, the National Waste Products (Ltd.), operating under the supervision of the National Salvage Council, is a "Government corporation, run in every respect on strict commercial lines, managed by an executive board of directors representing both the army and the civil side, debited with all the ordinary charges of a private or public corporation," primarily interested in developing a national waste-saving movement.

This salvage movement of Great Britain, like the Akron experiment, is the outgrowth of the war. The communities of that country were as poorly organized for community saving as were the urban centers of this country. The waste of the home was destroyed before collection or incinerated after collection. Many of the urban councils of Great Britain contracted for the collection of their waste, and the dustmen, or collectors, were not equipped to recover many valuable lines of waste.

The war forced the adoption of programs to stimulate waste collection and to check destruction. Early in the fall of 1914 the local Government board called upon the urban councils to institute waste-saving campaigns in each city. At that time the emphasis was thrown on waste paper because of the shipping situation. Great Britain manufactured paper mostly from wood pulp imported from Sweden and Canada. To continue to destroy paper-making material at home, and manufacture new material from imported material, was to court disaster.

The response was instant and generous. The women especially came to the relief of the Government and organized volunteer movements in every center for waste collection. The success of these cam-

paigns can be measured from the fact that the average paper collection in the United Kingdom in 1914 is estimated at 1,000 tons per week; by 1918 it had increased to 6,000 tons per week. At the opening of the war but 5 per cent of the total output of paper in that country was utilized in the manufacture of paper; by the close of the war about 50 per cent was being remanufactured into new grades.

What was true with regard to paper was also true with regard to rags, metals, and organic waste. The Government established large sorting plants for handling the cloth waste from the home stations of the army as well as the waste from the field of battle. The waste of the home stations and the battle field was handled through central depots, and during the first two years of the war about \$10,000,000 worth of material was sold, the cost of operation being about \$310,000. By adopting this system, woolen rags for the manufacture of reworked wool were secured in large quantities.

The shortage of grease and fats led to the development of a unique governmental function, a movement so expanded under war conditions that it promises to be a permanent feature of the activities of the Government. The reduction of organic waste in that country is a business controlled by private capital. The facilities and collections of these companies had to be greatly expanded if the country was to secure an adequate supply of grease and oils. In order to accomplish this purpose, the Government organized the Army Waste Products (Ltd.). This organization, which consisted of representatives of the army and members of the reducing firms, was empowered to establish prices and to allocate the collection of the material from the camps to the several plants. This governmental owned and operated holding company was successful from the start. The first statement of the financial return of this enterprise, released to the public through the office of the minister of munitions, placed the value of the glycerin at \$50,000 per week.

The saving programs instituted by other Government boards were operated with equal success, but the multiplicity of boards and functions led to confusion and lost motion, and to avoid this danger the function of the Army Waste Products (Ltd.) was further expanded under the supervision of a new board known as the national salvage council.

The national salvage council, which is advisory in nature, consists of a chairman, a deputy chairman, and two representatives each from the war office, admiralty, ministry of munitions, ministry of reconstruction, ministry of food, local government board, board of agriculture, board of trade, and the Scottish office.

The national salvage council was organized as an advisory board, and was the instrument of education in regard to waste reclamation. The director general of national salvage, operating in conjunction

with the council and under its supervision, was charged with the execution of the programs formulated by the national salvage council. The office of the director general of national salvage consisted of a chairman, a deputy chairman, and one member each appointed by the war office, admiralty, local government board, ministry of munitions, ministry of food, and the board of agriculture. The scope and function of this board ranged from the handling of the waste of the army to the development of the methods of collection of the waste of civil life and its reduction and utilization. This board was the clearance board through which industry was supplied with material; prices for waste material were established in conjunction with it, and the enforcing of the decrees for control of waste, and the development of the avenues of consumption were also vested in it. The director general of national salvage found many instances where the facilities for the collection and utilization of waste material did not exist. In order to properly develop them, it was determined that the functions of the Army Waste Products (Ltd.) should be greatly expanded, and a new company, controlled by the Government and financed largely through governmental funds, was organized, with sweeping powers vested in the newly-organized National Waste Products (Ltd.).

The purpose of such a development was outlined in a memorandum to the office of the department of the surveyor general of supply, under date of January 5, 1918. In order to coordinate the efforts being made by individual Government departments to conserve and return to circulation as serviceable material that had been theretofore either regarded as "waste" or disposed of in a "wasteful" manner, to lessen the quantity of new raw material which had to be imported, thereby releasing tonnage for other purposes, to increase the supply of raw material and to procure it as cheaply as possible, it was argued that the coordination of the efforts for collection would greatly increase the supply, while the coordinated research and investigation would develop new channels of utilization.

It was pointed out in the memorandum that a considerable amount of success had been achieved in centralized waste conservation by means of the Army Waste Products (Ltd.), a Government-owned corporation formed for the purpose of dealing with the waste products of the army. It was but necessary to increase the scope of its powers and functions in order to deal with the waste of the industrial and communal life. Therefore, it was recommended that the reorganized company, operating under the title of the National Waste Products (Ltd.), should have in connection therewith an advisory council on which every Government department in any way interested would be represented to formulate plans and programs for the development of the larger movement for waste.

The functions of this Government corporation were outlined in the memorandum of the 5th of January, 1918, as follows:

(1) To coordinate, advise, suggest, encourage, and if necessary direct the operations of public and private enterprises, having for their object the prevention of waste, the recovery of raw material, and the utilization of waste products; and only to themselves engage in such enterprises (a) when authorities or individuals are unable or unwilling from the nature or circumstances of the case to undertake the responsibility, (b) when it is considered necessary or advisable to put up more or less experimental plants to demonstrate any new or improved process, (c) when it is considered that any public or private enterprises are not being conducted to the best advantage from a national point of view, (d) when the urgent needs for any particular class of material call for drastic action in any particular direction.

(2) To supervise and where necessary control and provide for the disposal either of waste material or the products derived therefrom; and in this connection to regulate prices in a fair and reasonable manner.

(3) To continually prosecute research work either directly or by coordination of the various research laboratories throughout the Kingdom.

(4) To regulate all questions of transport labor and priority in connection with salvage schemes from the point of view of maximum national advantage.

(5) To prepare and publish from time to time statistics showing the practical and commercial results arising from activities in various directions, with a view to establishing the industrial benefit to be derived by the nation from such activities, not only during the continuance of the war but during the equally difficult period of demobilization and reconstruction to follow.

The following details of the working program had been passed upon and adopted by the Government at the time the memorandum was drafted. It was proposed:

(1) That the finance of the proposed company should be provided by a small Government loan on which the company could draw, if necessary, paying interest at the usual rates.

It is hoped that the financial results of the company's operations would soon render it independent of Government assistance.

(2) All waste material will be paid for and any profits arising after due provision has been made for depreciation, amortization, and reserve funds will be distributed on a proportionate basis among the sources from which the waste materials were derived, to be used in the case of municipalities, etc., in relief of rates or otherwise for their own purposes.

(3) The business of the company to be divided into two sections, army and civil, controlled by separate managers, who will, however, work in close cooperation. The development of the civil side of the company's activities will be administered by the principal officer of the waste-utilization section recently created by the department of food economy, which will now with the cordial approval of the director of that department be merged into the national scheme. Army Waste Products (Ltd.) will also be absorbed, its staff taken over to administer the army side of the new company.

(4) The army salvage organization would be responsible for the collection of army waste while directions as to civil waste would be issued to local authorities, municipalities, etc., through the ordinary channels available to the local government board.

(5) A special section for dealing with industrial "waste" in its wider sense would be set up in due course.

(6) The principal objective of the company will be to insure that the maximum quality "waste" is converted into "products" for distribution and disposal to Government departments, etc. The disposal branch already operating in connection with the army salvage organization would be utilized and expanded by means of a liaison executive clearing house system to insure that all waste products recovered are disposed of to the best advantage, with due regard to priority of need.

In the memorandum of association requesting incorporation, filed under the companies act of 1917, the objects for which the National Waste Products (Ltd.) was established were cited, as follows:

(a) To encourage and promote the prevention of waste.

(b) To advise, assist, foster, direct, promote, or finance any municipal, local, or other authorities, corporations, companies, bodies, firms, or individuals operating for the prevention of waste, the recovery of waste products or the utilization of raw material or carrying on any other salvage operations.

(c) To supervise or provide for the collection or disposal of waste or the products derived therefrom and to regulate prices.

(d) To organize, promote, finance, or assist in any experiments, tests, or other research or educational work in connection with the utilization of waste or other salvage operations, and to design, set up, and operate any experimental or technical plants, and to found, assist, or coordinate any laboratories or institutions in connection with any tests or research work.

(e) To establish, organize, and maintain information and investigation bureaux and to collect, prepare, and circulate statistics and information likely to be of assistance in promoting the effective treatment of waste material or the prevention of waste and indicating the commercial results derived or capable of being derived therefrom.

(f) To purchase, lease, design, manufacture, or otherwise acquire, improve, operate, and use, and to lend, let out, or dispose of any plant, apparatus, machinery, tools, or materials capable of being used in connection with the treatment of waste material or other salvage operations.

(g) To acquire the business and assets of Army Waste Products (Ltd.), or any part thereof, free from liabilities or subject to any liabilities or existing contracts as the company may consider expedient.

(h) Where the national salvage council are of opinion that the prevention or treatment of waste or the utilization of waste products or raw material of any description or other salvage operations are not being dealt with to the utmost national advantage, then the company may, if so directed by the national salvage council, purchase, collect, take over, or otherwise acquire waste or raw material of any description and from any sources and to refine, develop, improve, manufacture, prepare for market, or otherwise treat and to sell or otherwise deal with or dispose of the same or any products resulting therefrom.

(j) To purchase or otherwise acquire, use, develop, or turn to account any interest in any patents, licenses, processes, or the like conferring a right to use any plant, process, or information concerning any invention or article which may seem capable of being utilized by the company to advantage.

(k) To make arrangements for the transportation, shipping, handling, and distribution of any waste or the products resulting therefrom and, if deemed expedient, to own, charter, lease, operate, control, or hold any interest in any

ships, railways, tramways, motor vehicles, or other means of conveyance or transport, and to acquire, own, or hold any interest in any docks, quays, sidings, or other shipping or railway facilities.

(l) To acquire and hold any lands or interest in lands or any other property or rights, whether real or personal, in any part of the world.

(m) To build, set up, construct, repair, alter, or acquire any factories, workshops, garages, warehouses, offices, or other buildings.

(n) To invest in, acquire, hold, and dispose of the debentures, debenture stock, obligations, stocks, shares, securities, or investments of any governments, municipalities, authorities, corporations, companies, bodies, or firms, and to place money on deposit with any bankers or elsewhere.

(o) To enter into any agreements for sharing profits, joint adventure, or other arrangements of a like nature with any other authorities, corporations, companies, bodies, firms, or individuals having the treatment of waste or other salvage operations as any of their objects.

(p) To borrow or raise money for the purposes of the company by the issue of debentures, mortgages, or otherwise, as may be thought expedient, and for such purposes to charge (if thought fit) all or any part of the property of the company present or future, including uncalled capital, but no such powers shall be exercised without the sanction of the national salvage council first given.

(q) To make, draw, accept, indorse, discount, and issue promissory notes, bills of exchange, and other negotiable and transferable instruments.

(r) To lend money with or without security upon such terms as the company may think fit and to guarantee the performance of any contracts, covenants, or obligations.

(s) To enter into any arrangements with any Government or other authority, whether municipal, local or otherwise, and to obtain from any such Government or authority any rights, powers, concessions, charters, or privileges which may be thought conducive to the furtherance of the company's objects or any of them.

(t) To sell, dispose of, or otherwise deal with or turn to account the undertaking of the company or all or any part of its assets or rights and either for cash, debentures, debenture stock obligations, shares or interests or any Government authority, municipality, corporation, company, or body.

(u) To do all such other things as are incidental or may be thought conducive to the attainment of the above objects or any of them and to operate in any part of the world.

Waste conservation was a war-time necessity. The methods developed to meet the war situation will doubtless serve as a basis of organization of the movements for conservation in peace times. This war-born organization for a nation-wide system of reclamation will doubtless assist Great Britain materially in the intense commercial competition which is certain to follow as a result of the struggle to regain markets lost during the war. The National Waste Products (Ltd.), is an instrument evolved by the British Government to assist the military program. Its retention as an aid in the commercial program is practically assured. The Akron Industrial Salvage Co. experiment was the outgrowth of a war necessity. It was an instrument evolved under similar circumstances by an agency of our Government to assist in the military program of this country. The



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program was evolved in the same month and year that Great Britain reorganized her national system of waste reclamation, and was put into effect at practically the same time. Both systems demonstrated their value under war conditions. Their wider use and adaptation to the needs of the countries under peace-time conditions will doubtless be made.

The future development of the National Waste Products (Ltd.), being a Government corporation, rests solely with the British Government; the further development and extension of the American experiment for waste saving, by means of a community-incorporated system, rests with the municipal authorities, boards of trade, and other civic bodies of this country.

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